Ladies and gentlemen, students and colleagues:

Welcome to this new academic year at our university. We have a full house. It’s exciting to welcome close to 2,300 new bachelor students here today. This is again a record for our university, more than 10 percent higher than last year. In seven years, we see a doubling of our bachelor enrollment. We’re proud and delighted that so many have chosen to come to Eindhoven for their academic education.

We have reached full capacity now, and a further increase in enrollment cannot be accommodated at our current budget. While we have a doubling in enrolment, our budget has only increased marginally. This puts a very high pressure on our staff and infrastructure. To limit further growth, and safeguard the high quality of our education and research, we have decided last year to implement a numerus fixus on at least four programs starting next academic year. We cannot exclude additional caps thereafter.

Lars Middel, our master of ceremonies, has already introduced today’s theme: *The Magic of Science and Education*. Don’t expect me to be backflipping or disappearing in a cardboard box. I’ll leave that to Victor Mids, the neuromagician who will perform later this afternoon. I very much look forward to his magic show.
Instead, I’ll show you how technology can work wonders. And *should* work wonders.

**Welcome special guests**
I very much agree with Lars, who introduced our guests for this afternoon. It is a great pleasure and honor to welcome them. Alexander Pechtold, we very much appreciate that you could come here amid what appears to be the final stage of coalition formation. Tessie Hartjes, Daniel Lakens and Tom de Greef. It is great to have you here – we all look forward to your stories.

**Magical technology**
So, let’s talk magic.
The magic of science and education becomes apparent when one looks ahead. Isn’t it *unbelievable* that an autonomous car will soon be safer than a human driver? Will we allow humans to drive a car in, say, 2030, or will we deem that irresponsible? And?
Will biomaterials mend a broken heart?

Not so long ago, we would have called those things “magic.” They were far beyond reality. But we are rapidly moving the boundaries of reality. And everyone in this hall can play a role in it.

Together we can undo the magic. Because that’s our task, as I see it. Magic—that’s how outsiders often look at science and technology. A black box with perplexing and confusing contents. Calling it magic precludes comprehension. Magic is the opposite of curiosity. We need to undo the magic and replace it with knowledge and experience.
And I am sure Victor Mids as an illusionist would agree. He is also a medical doctor and knows exactly how our senses work—and how to deceive them. His illusions are based on facts and experience, not on a gut feeling or prejudice.

Only by thoughtful progress, by piecing together what we know and what we experience, can we do what—to an outsider—looks like magic.

**Looking toward 2030**

After all the changes that we have implemented in recent years, and associated successes, we cannot rest on our laurels. We have to look forward, to 2030 and beyond. That may seem far away, but thinking about 2030 is really about what to do tomorrow. I call on everyone to participate in our Expedition 2030. We need your ideas and visions.

Central is our ambition, and obligation, to build a Leading European Science and Technology University.

Let me explain what I mean:

*Leading* – refers to the ambitious level we strive to attain. We want to be among the top European engineering universities. We have to, to be a driving force in the technology hotspot that we are located in.

*European* – We are an international, public university, in compliance with the European guidelines.
Science – Much of our research is exploratory, often driven by curiosity. It pushes against the boundaries and finds unexpected answers. It is scientifically sound and world class.

Technology – We are deeply rooted in one of the most vibrant technology hot spots of Europe, and we don’t shy away from real-world challenges. We know how to transfer our technology to society.

University – We educate and train talent, by pairing research with education. We are not a research institute.

This is feasible if we continue to build on existing and emerging pockets of excellence in our university that are viable, sustainable and of sufficient critical mass.

**Education**
The last few years we did magic in education. We have completely transformed our program. It’s engaging, relevant, international, doable, and future-proof. We attract a large number of students, and their success rate is higher than ever before.

This transformation was tightly managed, and for good reasons; otherwise it would have ended up in chaos. It is now time to make the system more flexible, reduce the bureaucracy, and empower our teachers, while maintaining the core vision and framework.

We will continue to innovate and improve our education where needed.
One example is our Innovation Space in the Gaslab building which will open next week. It will be a place where students work in multidisciplinary teams solving real-world challenges. Please go there and experience it for yourself.

Digital technologies will impact what and how we teach. Developing a clear vision in this respect is needed, in line with the Digital Society initiative of the VSNU. We should realize that the current concept of university education is being challenged by outsiders who may come to dominate online courses, the ‘Amazon’s of higher education’ to be. We will see online classes, online collaborations, the unbundling of curricula, and new ways of exchanging knowledge and experiences.

But, as I envision it, our campus will remain central to our education. As an engineer, you will need more than a collection of facts from the Internet. You need to practice, you need to work side by side, struggle with a problem, fail, do it again, celebrate a breakthrough. That experience is essential. It enables growth as human beings.

**The future of research**
Research will also change toward 2030. Future national and European research funding will be largely driven by grand societal challenges and the advancement of key enabling technologies.

We will need new abilities to tackle the major issues that confront us.
Shortly after the first moon landing, an American economist asked this question: “If we can land a man on the moon, why can’t we solve the problems of the ghetto?.”

The answer is this: rocket science is simple. Simple compared to slums, or to climate change, or health care, or mobility.

The societal challenges we’re confronted with can’t be solved within a single discipline, they can’t even be defined in technical terms alone, as a mission to the moon could.

We need to address the complexity of these issues in new ways. That requires multi-disciplinary collaboration. We need to connect researchers from different disciplines across departmental and institutional boundaries, and across borders. We need to connect bright minds.

We are well positioned to confront these complex problems with our strategic focus on energy, health, and mobility. But as we set up our strategy for 2030, we need to discuss how to proceed.

Fundamental research

The solutions to many societal challenges require long-term fundamental research.

That’s my message to the coalition that is being formed in The Hague.

In the Netherlands, we are lagging. Not only in the total amount of R&D investment\(^1\), but specifically, we are at the bottom of the list of public R&D spending on science and technology. In Germany, these

\(^1\) https://www.knaw.nl/nl/actueel/nieuws/wetenschap-in-nederland
account for about 60% of public R&D spending. In the Netherlands, they account for only 39%² (2015), and this share is falling. If the government is serious about solving issues beyond the four-year electoral horizon, we will need a significant boost in public R&D investments in science and technology. The total We can’t do magic. We need a strong base in fundamental research.

**Individual excellence**

It all starts with individual excellence and curiosity. It’s great to see the excellence of our scientists recognized by their peers. This year our scientists have been awarded seven VENI and seven VIDI grants, we got a Gravitation grant for Materials Driven Regeneration, next to many other grants obtained this year. I have asked two award-winning scientists to present their visions today: Daniel Lakens, (from the Department of Industrial Engineering and Innovation) and Tom de Greef (from Biomedical Engineering).

On this campus, innovation starts with people. We must give individual scientists independence, breaking down hierarchy in places. We will invest in building academic leadership. Leadership that makes a difference in science and education, that reaches out to colleagues in other disciplines and has the vision to forge long term partnerships, and inspires others. One step in this direction is the establishment of The Young Academy of Engineering Eindhoven. Dr. Patricia Dankers and Prof. Johan van Leeuwaarden lead this initiative. They are currently members of The Young Academy of the Royal Netherlands Academy of Arts and Sciences.

Diversity
The diversity of our student population is steadily growing. We see a steady increase in the number of female and international students. We should embrace this diversity, and turn it into our asset. After all, we want to attract the most talented individuals. Unfortunately, the diversity of staff lags behind. That is not just a matter of getting the numbers right. It’s about attitude.

We need to create a culture that appeals to all, and recognizes the value of diversity.

That is far from straightforward. We have taken a first step by appointing Prof. Eva Demerouti as Chief Diversity Officer. She is an excellent scientist, and her research field Organizational Behavior and Human Decision Processes is a perfect match to this challenge.

Dear Colleagues,
It will be a particularly challenging year for all of us. We’ll continue developing the Bachelor College and Graduate School. Research will be challenging. All this will demand a huge amount of your energy.

Meanwhile, to you, our students: Discover what’s behind the magic of science and education. See for yourself! Go and listen, follow your curiosity, and work together.

This university hosts many exceptionally bright minds. By connecting them, we have an incredible opportunity to move science and technology forward, improve education, and address pressing societal challenges. Together, we can do magic.
Let’s make this a wonderful year together.
Thank you.

-o-o-o-o-